

# PATENT ABSTRACTS OF JAPAN

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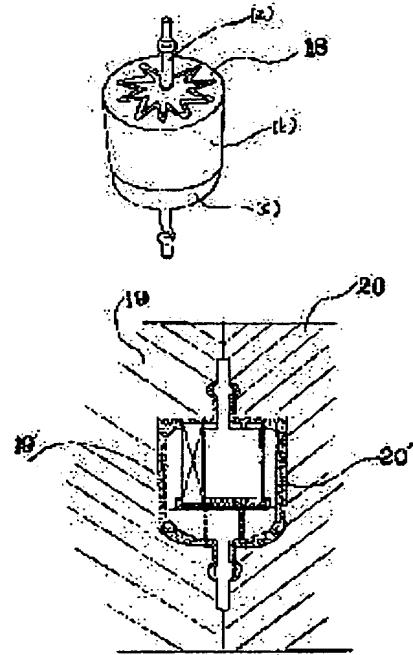
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 (22)Date of filing : **30.09.1992** (72)Inventor : **SAITO JUN**

## (54) PRODUCTION OF RESIN FILTER

### (57)Abstract:

**PURPOSE:** To certainly seal a bonded surface by injecting a molten resin in the gap between a mold and a jig to form an integrated case having no bonded surface and simultaneously embedding the upper and lower ends of the filter element within the jig in the molten resin.

**CONSTITUTION:** Filter element holding jigs (a)-(c) are formed from a low m.p. metal such as a tin-bismuth alloy and a filter element 1 such as chrysanthemum like pleated filter paper is closely bonded to the ridge part of the jig (a) and inserted in the jig (b) until it comes into contact with the jig (c). Subsequently, this assembled jig is arranged in molds 19, 20 and both molds are closed. A molten thermoplastic resin such as a polyamide resin is injected in the molds to fill the gaps of the molds 19, 20. Next, the molds are cooled and the molded one is detached from the molds and heated at a predetermined temp. to obtain a resin filter.



## LEGAL STATUS

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[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

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**CLAIMS**

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**[Claim(s)]**

[Claim 1] Consist of low-melt point point material, and a filtration element is made close to the body periphery of a fixture which prepared the Kaminaka core pole set up to the upper bed side of a body. Similarly consist this of low-melt point point material, and it inserts in main opening of the fixture of the shape of a cylinder which has main opening. The fixture which changes with the base with which the Shimonaka core pole which similarly consists of low-melt point point material, has two or more breakthroughs, and hangs from a lower base side was prepared in the soffit of this fixture is made to contact. Thus, the manufacture approach of the filter made of resin which arranges a \*\*\*\* fixture with a group in the die with which the concave of a predetermined configuration was formed, injects high-melting melting resin in the gap formed between a die and each fixture, heats it after cooling from each above-mentioned fixture, is made to carry out melting of each fixture, discharges this, and changes.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Industrial Application] This application is related with the manufacture approach of the filter made of resin which contains a filtration object and is formed in the case which consists of resin material.

#### [0002]

[Description of the Prior Art] The filter made of resin is the thing of the structure which arranged the filtration object 4 by which the rib chip box was carried out to the shape of a chrysanthemum in the case 3 formed like drawing 7 with the covering 2 as well as the body 1 which consists of resin material.

[0003] Such a filter fabricates the \*\*\*\* body 1 and covering 2, and, similarly is formed of the process which joins the upper bed of the \*\*\*\* assembly \*\*\*\* filtration object 4 to covering 2, and joins covering 2 and the body 1 further.

#### [0004]

[Problem(s) to be Solved by the Invention] In the above-mentioned process, the body 1 and covering 2 will be unified by the junction process, and the filtration object 4, covering 2 and the soffit plate 5 which forms the filtration object 4 further, and the rib chip box filter paper 6 will be respectively unified through a junction process. At the junction process, the conjugation method and joining conjugation method by adhesives are used.

[0005] Therefore, the above-mentioned junction does not necessarily bring about a perfect seal. If it is in the filter which filters especially fuels, such as a gasoline, possibility of adhesives exfoliating and bringing about a poor seal is high. Moreover, adhesives melt into filtrate and the fault of polluting filtrate may also be produced.

#### [0006]

[Means for Solving the Problem] Consist of low-melt point point material, and a filtration element is made close to the body periphery of a fixture which prepared the Kaminaka core pole set up to the upper bed side of a body. It inserts in main opening of the fixture of the shape of a cylinder which similarly consists this of low-melt point point material, and has main opening. The fixture which changes with the base with which the Shimonaka core pole which similarly consists of low-melt point point material, has two or more breakthroughs, and hangs from a lower base side was prepared in the soffit of this fixture is made to contact. Thus, the attached fixture is arranged in the die with which the concave of a predetermined configuration was formed, and from each above-mentioned fixture, high-melting melting resin is injected in the gap formed between a die and each fixture, is heated after cooling, melting of each fixture is carried out, and it considers as the configuration which makes this discharge.

#### [0007]

[Function] Injection of melting resin forms an one-case without a plane of composition in the gap between a die and each fixture. Simultaneously, the vertical edge of a filtration element established in the fixture is laid underground in melting resin. If melting of the fixture is carried out, a melting fixture will be discharged outside from the close outlet of a case.

#### [0008]

[Example] If the example of the filter made of resin obtained by the manufacture approach of this invention is explained previously, in drawing 1, the filtration object 34 is arranged in the case 33 made of resin where the close outlets 31 and 32 were formed. Two or more support pieces 35 are set up by the upper bed of the outlet 32 of the bottom wall within a case 33, and the disk-like supporting plate 36 is formed in the upper bed. The filtration object 34 consists of the filter paper by which the rib chip box was carried out to the shape of a chrysanthemum, the upper bed is laid under the upper wall within a case 33, and the soffit is

respectively laid under the supporting plate 36.

[0009] In this filter, it does not have the joint or joining joint by adhesives.

[0010] Next, the manufacture approach of such a filter made of resin is explained.

[0011] The manufacture approach of this invention consists the process which holds a filtration element to a filtration element maintenance fixture, the process which arranges in a die the maintenance fixture held in this way, the process which injects melting resin in a die, and said maintenance fixture of melting and the process to discharge.

[0012] A filtration element maintenance process can prepare and begin a filtration element maintenance fixture first. This maintenance fixture consists of a fixture (a), (b), and (c). The fixture (a) has the Kaminaka core pole 12 set up to the body 11 which formed two or more Yamabe 10 who projects towards the method of outside on a periphery like drawing 2, and the core of the upper bed side. Two or more Yamagata slots 13 extended from the main opening 21 to a radial towards the method of outside were formed like drawing 3, and the fixture (b) has constituted the shape of a cylinder by which the disk-like crevice 14 was formed in the soffit side. The fixture (c) has the Shimonaka core pole 16 which hangs from the lower base side of a base 15 like drawing 4 R>4, and two or more breakthroughs 17 are formed in the top face on the periphery.

[0013] Each above-mentioned fixture (a), (b), and (c) are formed by each from a low-melt point point metal like a SUZU bismuth system alloy. Moreover, Yamabe 10 of the above-mentioned fixture (a) and several Yamagata said slots 13 of a fixture (b) are formed.

[0014] A filtration element 18 like a chrysanthemum-like rib chip box filter paper is made close to Yamabe 10 of a fixture (a), subsequently to the core of a fixture (b), this fixture is inserted and a fixture (c) is made to contact the lower base side of a fixture (b). Thereby, the filtration element 18 is held between a fixture (a) and (b) (drawing 5).

[0015] Thus, subsequently to in a die, the attached fixture is arranged. A die consists of the right-and-left molds 19 and 20 like drawing 6. Concave 19' of a predetermined configuration and 20' are formed in both the molds 19 and 20. If the above-mentioned fixture is arranged between the right-and-left mold 19 and 20 and both molds are closed, a gap will be formed between the above-mentioned fixture and both the molds 19 and 20.

[0016] The melt of thermoplastics like polyamide resin is injected in a die. The above-mentioned gap is filled up with melting resin.

[0017] Subsequently, what was fabricated is demounted from a die after cooling, and it heats at predetermined temperature. For example, if it heats at 120-150 degrees C, melting of the above-mentioned fixture is carried out and this is discharged when the melting point forms the above-mentioned fixture with a low-melt point point metal 100 degrees C or less and the above-mentioned resin is used as the polyamide system resin whose melting point is 250-280 degrees C, the filter made of resin shown in drawing 7 will be formed.

[0018] In the above-mentioned example, as a filtration element, although the chrysanthemum-like rib chip box filter paper was explained to the example, the same is said also of a metal wire gauze and a metal sintered compact. In these cases, the configuration of the above-mentioned fixture becomes a thing corresponding to these things. Moreover, from the above-mentioned thermoplastics, if the construction material of the above-mentioned fixture is the construction material of a low-melt point point, it will not be limited to a metal.

[0019]

[Effect of the Invention] As mentioned above, according to this invention, without [ without a case and a filtration object use adhesives, and ] being accompanied by the plane of composition, since it is unified, the filter made of resin which the poor seal, in a joint does not produce at all is brought about.

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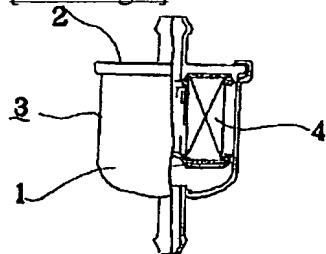
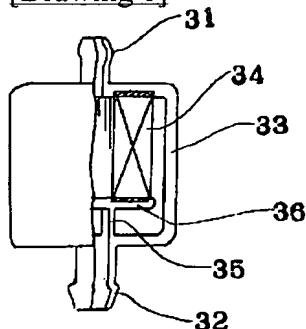
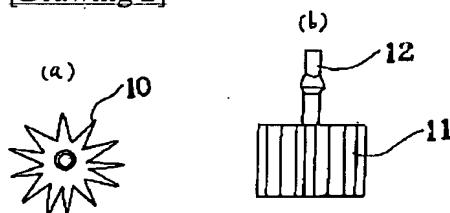
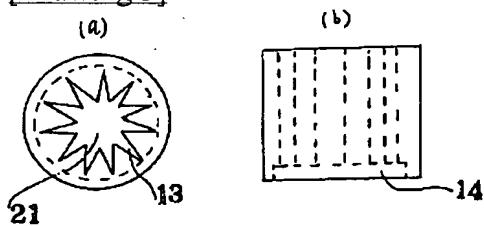
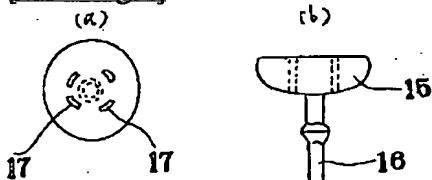
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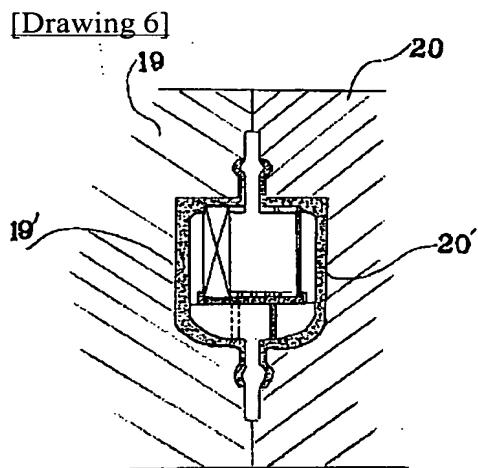
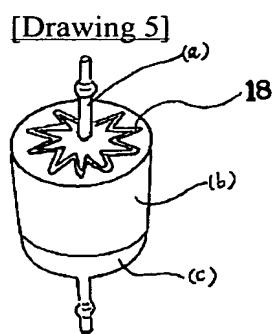
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**DRAWINGS**

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**[Drawing 7]****[Drawing 1]****[Drawing 2]****[Drawing 3]****[Drawing 4]**



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[Translation done.]

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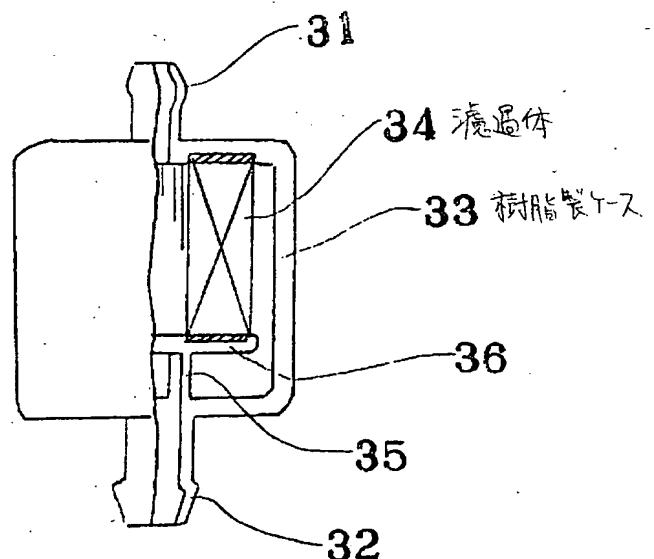
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## (54)【発明の名称】樹脂製フィルタの製造方法

## (57)【要約】

【目的】樹脂製ケース内に、濾過エレメントを配設し、これらを一体化したフィルタの製造方法において、各接合部を確実にシールする樹脂製フィルタをもたらすことが可能な製造方法を提供する。

【構成】低融点材より成る治具の外周に濾過エレメントを密接し、これを成形型内に配設する。次いで、上記治具の融点より高い融点を持つ、熱可逆性樹脂を溶融しこれを、成形型と治具の間の隙間に射出する。冷却後、加熱して治具を溶融、排出する。これにより、接合面を10有しないケースから成るフィルタが形成される。



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## 【特許請求の範囲】

【請求項 1】 低融点材から成り、円筒部の上端面に立設する上中芯柱を設けた治具の円筒部外周に濾過エレメントを密接させ、これを、同じく低融点材から成り、中心開口を有する円筒状の治具の中心開口に挿設し、該治具の下端に、同じく低融点材から成り、複数の貫通孔を有しており下底面から垂下する下中芯柱が設けられた基体で成る治具を当接させ、このように組付られた治具を、所定形状の凹溝が形成された成形型内に配設し、上記各治具より高融点の溶融樹脂を成形型と各治具との間に形成される間隙に射出し、冷却後、加熱して各治具を溶融させ、これを排出して成る樹脂製フィルタの製造方法。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】本願は、樹脂材から成るケース内に、濾過体を収納して形成される樹脂製フィルタの製造方法に関する。

## 【0002】

【従来の技術】樹脂製フィルタは、たとえば図7のように、樹脂材から成るボディ1と同じくカバー2とで形成されるケース3内に菊花状にひだ折りされた濾過体4を配設した構造のものである。

【0003】このようなフィルタは、はじめボディ1、カバー2を成形しておき、同じくはじめ組立られた濾過体4の上端を、カバー2に接合し、さらにカバー2とボディ1とを接合する製法により形成されている。

## 【0004】

【発明が解決しようとする課題】上記製法では、ボディ1とカバー2とが接合工程により一体化され、また濾過体4とカバー2、さらに濾過体4を形成している下端板5とひだ折り濾紙6とが各々接合工程を経て一体化されることになる。接合工程では、接着剤による接合法や溶着接合法が用いられている。

【0005】したがって、上記接合は、完全なシールをもたらすとは限らない。特にガソリンなどの燃料を濾過するフィルタにあっては、接着剤が剥離してシール不良をもたらす可能性が高い。また、接着剤が濾液中に溶けて、濾液を汚染するという欠点も生じ得る。

## 【0006】

【課題を解決するための手段】低融点材から成り、円筒部の上端面に立設する上中芯柱を設けた治具の円筒部外周に濾過エレメントを密接させ、これを、同じく低融点材から成り中心開口を有する円筒状の治具の中心開口に挿設し、該治具の下端に、同じく低融点材から成り、複数の貫通孔を有しており下底面から垂下する下中芯柱が設けられた基体で成る治具を当接させ、このように組付けられた治具を、所定形状の凹溝が形成された成形型内に配設し、上記各治具より高融点の溶融樹脂を成形型と各治具との間に形成される間隙に射出し、冷却後、加熱

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して各治具を溶融させ、これを排出させる構成としたものである。

## 【0007】

【作用】成形型と各治具との間の間隙に、溶融樹脂が射出されると、接合面のない一体的なケースを形成する。同時に、治具に設けられた濾過エレメントの上下端は、溶融樹脂内に埋設される。治具を溶融させると、溶融治具は、ケースの入出口から外部に排出する。

## 【0008】

10 【実施例】本発明の製造方法により得られる樹脂製フィルタの例を、先に説明すると、図1において、入出口31、32を設けた樹脂製ケース33内に、濾過体34が配設されている。ケース33内の底壁の出口32の上端には、複数の支持片35が立設され、その上端にディスク状の受板36が形成されている。濾過体34は、菊花状にひだ折りされた濾紙から成り、その上端がケース33内上壁に、また下端が受板36に、各々埋設されている。

20 【0009】このフィルタにおいては、接着剤による接合部や溶着接合部を有していない。

【0010】次にこのような樹脂製フィルタの製造方法を説明する。

【0011】本発明の製造方法は、濾過エレメント保持治具に濾過エレメントを保持する工程と、このように保持された保持治具を成形型内に配設する工程と成形型内に溶融樹脂を射出する工程と、前記保持治具を溶融、排出する工程とから成る。

【0012】濾過エレメント保持工程は、まず、濾過エレメント保持治具を用意して始められる。該保持治具は、治具(a) (b) (c) から成る。治具(a)は、図2のように、外周に外方に向け突出する複数の山部10を設けた円筒部11とその上端面の中心部に立設する上中芯柱12とを有している。治具(b)は、図3のように、中心開口21から外方に向け放射状に伸びる複数の山形溝部13が設けられ、下端面にディスク状凹部14が形成された円筒状を成している。治具(c)は、図4のように、基体15の下底面から垂下する下中芯柱16を有しており、上面には円周上に複数の貫通孔17が設けられている。

40 【0013】上記各治具(a) (b) (c) は、いずれも、たとえばスズーピスマス系合金のような低融点金属から形成されている。また、上記治具(a)の山部10と、治具(b)の山形溝部13とは、同数個設けられる。

【0014】治具(a)の山部10に、菊花状ひだ折り濾紙のような、濾過エレメント18を密接させ、次いでこの治具を、治具(b)の中心部に挿設し、治具(b)の下底面に治具(c)を当接させる。これにより、濾過エレメント18は、治具(a) (b) 間に保持される(図5)。

【0015】このように組付けられた治具は、次いで成形型内に配置する。成形型は図6のように左右型19、20から成る。両型19、20には、所定形状の凹溝19'、20'が形成されている。上記治具を左右型19、20間に配設し、両型を閉じると、上記治具と両型19、20との間に、間隙が形成される。

【0016】成形型内には、たとえばポリアミド樹脂のような熱可塑性樹脂の溶融物が射出される。溶融樹脂は、上記間隙に充填される。

【0017】次いで、冷却後、成形されたものを成形型から取外し、所定温度で加熱する。たとえば、上記治具を融点が100°C以下の低融点金属で形成し、上記樹脂を融点が250~280°Cのポリアミド系樹脂とした場合、120~150°Cで加熱し、上記治具を溶融させ、これを排出すると、図7に示した樹脂製フィルタが形成される。

【0018】上記実施例において、濾過エレメントとして、菊花状ひだ折り濾紙を例に説明したが、金属製の金網や焼結体でも同様である。これらの場合には、上記治具の形状がこれらのものに対応したものとなる。また、上記治具の材質は、上記熱可塑性樹脂より低融点の材質であれば金属に限定されない。

#### 【0019】

【発明の効果】以上のように、本発明によれば、ケス

と濾過体とが接着剤を用いることなく、かつ接合面をともなうことなく、一体化されるから接合部におけるシール不良の全く生じない樹脂製フィルタをもたらす。

#### 【図面の簡単な説明】

【図1】本発明により製造される樹脂製フィルタの断面図である。

【図2(a)、(b)】治具(a)を示す図である。

【図3(a)、(b)】治具(b)を示す図である。

【図4(a)、(b)】治具(c)を示す図である。

【図5】治具(a)、(b)、(c)を組付けた状態を示す図である。

【図6】各治具を成形型内に配設し溶融樹脂を射出した状態を示す断面図である。

【図7】従来の製法により得られる樹脂製フィルタの断面図である。

#### 【符号の説明】

11 円筒部

12 上中芯部

15 基部

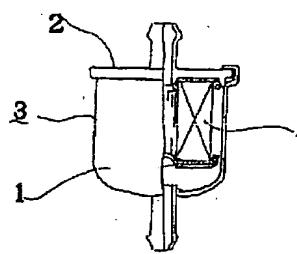
16 下中芯部

17 貫通孔

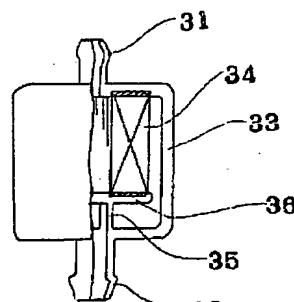
18 濾過エレメント

19、20 成形型

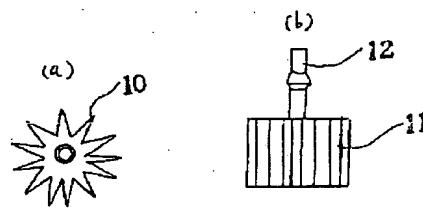
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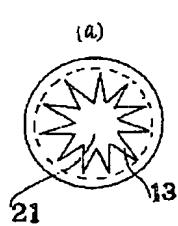
【図1】



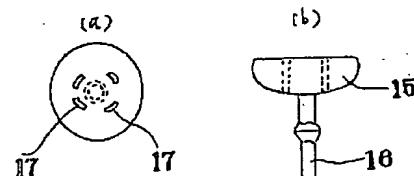
【図2】



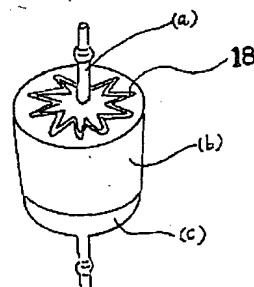
【図3】



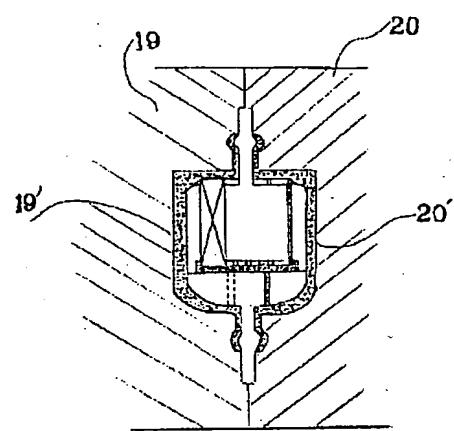
【図4】



【図5】



【図6】



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